

In re Application of:

Examiner: TBA

Art Unit: 1645

Confirmation No. 2590

For: DIRECT SNP DETECTION WITH  
UNAMPLIFIED DNA

**McDonnell Boehnen Hulbert & Berghoff LLP**  
300 South Wacker Drive, 32nd Floor  
Chicago, IL 60606  
Telephone: (312) 913-0001  
Fax: (312) 913-0002



PATENT

In re Application of:	)	
	)	
Bao, et al.	)	Examiner: TBA
	)	
Serial No. 10/735,357	)	
	)	Group Art Unit: 1645
Filed: December 12, 2003	)	
	)	
For: DIRECT SNAP DETECTION WITH	)	Confirmation No.: 2590
UNAMPLIFIED DNA	)	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Stimpson, et al., U.S. Patent No. 5,599,668 issued 02/04/97.
2. Alivisatos, et al., U.S. Patent No. 5,751,018 issued 05/12/98.

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<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

3. Weiss, et al., U.S. Patent No. 5,990,479 issued 11/23/99.
4. International Patent No. WO 92/04469 published 05/19/92.
5. Stimpson, et al., "Real-time detection of DNA hybridization and melting on oligonucleotide arrays by using optical wave guides," *Proc. Natl. Acad. Sci.*, Vol. 92, pp. 6379-6383, California Institute of Technology (1995) U.S.
6. Storhoff, et al., "Strategies for Organizing Nanoparticles into Aggregate Structures and Functional Materials," *Journal of Cluster Science*, Vol. 8, No. 2, pp. 179-217, Plenum Publishing Corporation (1997) U.S.
7. Storhoff, et al., "One-Pot Colorimetric Differentiation of Polynucleotides with Single Base Imperfections Using Gold Nanoparticle Probes," *J. Am. Chem. Soc.*, Vol. 120, pp. 1959-1964, American Chemical Society (1998) U.S.
8. Tomlinson, et al., "Detection of Biotinylated Nucleic Acid Hybrids by Antibody-Coated Gold Colloid," *Analytical Biochemistry*, Vol. 171, pp. 217-222, (1988)
9. Velez, et al., "In Situ Assembly of Colloidal Particles into Miniaturized Biosensors," *Langmuir*, Vol. 15, No. 11, pp. 3693-3698, American Chemical Society (1999) U.S.
10. Zhu, et al., "The First Raman Spectrum of an Organic Monolayer on a High-Temperature Superconductor: Direct Spectroscopic Evidence for a Chemical Interaction between an Amine and  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ ," *J. Am. Chem. Soc.*, Vol. 119, pp. 235-236, American Chemical Society (1997) U.S.
11. Yguerabide, et al., "Light-Scattering Submicroscopic Particles as Highly Fluorescent Analogs and Their Use as Tracer Labels in Clinical and Biological Applications," I. Theory, *Analytical Biochemistry*, Vol. 262, pp. 137-156 (1998) U.S.
12. Yguerabide, et al., "Light-Scattering Submicroscopic Particles as Highly Fluorescent Analogs and Their Use as Tracer Labels in Clinical and Biological Applications," II. Experimental Characterization, *Analytical Biochemistry*, Vol. 262, pp. 157-176 (1998) U.S.

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each

document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

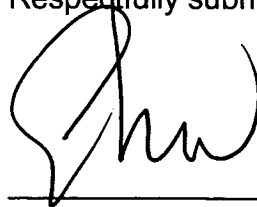
The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

Dated: Aug. 4, 2004

McDonnell Boehnen Hulbert & Berghoff LLP  
300 South Wacker Drive  
Chicago, Illinois 60606

Respectfully submitted,



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Emily Miao  
Registration No. 35,285

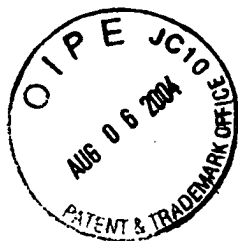
FORM PTO-1449  
(Rev. 2-32)U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No.

02-1227-A

Serial No.

10/735,357

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(Use several sheets if necessary)

Applicant:

Bao, et al.

Filing Date:

December 12, 2003

Group:

1645

## U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	1.	5,599,668	02/04/97	Stimpson, et al.			
	2.	5,751,018	05/12/98	Alivisatos, et al.			
	3.	5,990,479	11/23/99	Weiss, et al.			

## FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation Yes	No
	4.	WO 92/04469	05/19/92	PCT				

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

	5.	Stimpson, et al., "Real-time detection of DNA hybridization and melting on oligonucleotide arrays by using optical wave guides," <i>Proc. Natl. Acad. Sci.</i> , Vol. 92, pp. 6379-6383, California Institute of Technology (1995) U.S.
	6.	Storhoff, et al., "Strategies for Organizing Nanoparticles into Aggregate Structures and Functional Materials," <i>Journal of Cluster Science</i> , Vol. 8, No. 2, pp. 179-217, Plenum Publishing Corporation (1997) U.S.
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	10.	Zhu, et al., "The First Raman Spectrum of an Organic Monolayer on a High-Temperature Superconductor: Direct Spectroscopic Evidence for a Chemical Interaction between an Amine and Yb <sub>2</sub> Cu <sub>3</sub> O <sub>7-δ</sub> ," <i>J. Am. Chem. Soc.</i> , Vol. 119, pp. 235-236, American Chemical Society (1997) U.S.

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

<b>FORM PTO-1449</b> <b>(Rev. 2-32)</b>  <b>U.S. Department of Commerce</b> <b>Patent and Trademark Office</b>  <b>INFORMATION DISCLOSURE</b> <b>STATEMENT BY APPLICANT</b>  (Use several sheets if necessary)	<b>Atty. Docket No.</b>  02-1227-A	<b>Serial No.</b>  10/735,357
	<b>Applicant:</b>  Bao, et al.	
	<b>Filing Date:</b>  December 12, 2003	<b>Group:</b>  1645

## U.S. PATENT DOCUMENTS

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

## FOREIGN PATENT DOCUMENTS

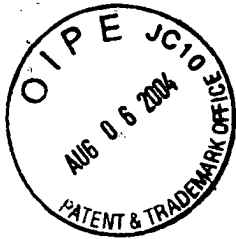
Document Number	Date	Country	Class	Subclass	Translation Yes No	

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).

11.	Yguerabide, et al., "Light-Scattering Submicroscopic Particles as Highly Fluorescent Analogs and Their Use as Tracer Labels in Clinical and Biological Applications," I. Theory, <i>Analytical Biochemistry</i> , Vol. 262, pp. 137-156 (1998) U.S.
12.	Yguerabide, et al., "Light-Scattering Submicroscopic Particles as Highly Fluorescent Analogs and Their Use as Tracer Labels in Clinical and Biological Applications," II. Experimental Characterization, <i>Analytical Biochemistry</i> , Vol. 262, pp. 157-176 (1998) U.S.

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 02-1227-A)

In re Application of:	)	
	)	
Yijia P. Bao, et al.	)	
	)	Examiner: TBA
Serial No.: 10/735,357	)	
	)	Art Unit: 1645
Filed: December 12, 2003	)	
	)	Confirmation No. 2590
For: DIRECT SNP DETECTION WITH	)	
UNAMPLIFIED DNA	)	

**TRANSMITTAL LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

- In regard to the above identified application.
1. We are transmitting herewith the attached:
    - a) Sixth Supplemental Information Disclosure Statement with copies of 4 references
    - b) IDS PTO Form-1449
    - c) Return Receipt Postcard
  2. With respect to fees:
    - a) No check is attached.
    - b) **General Authorization:** Please charge any underpayment or credit any overpayment our Deposit Account, No. 13-2490.
  3. **CERTIFICATE OF MAILING UNDER 37 CFR § 1.8:** The undersigned hereby certifies that this Transmittal Letter and the paper, as described in paragraph 1 hereinabove, are being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 4 day of August, 2004.

Date: Aug. 4, 2004

Respectfully submitted,

  
\_\_\_\_\_  
Emily Miao  
Registration No. 35,285



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 02-1227-A)

In re Application of:	)	
	)	
Bao, et al.	)	Examiner: TBA
	)	
Serial No. 10/735,357	)	
	)	Group Art Unit: 1645
Filed: December 12, 2003	)	
	)	
For: DIRECT SNP DETECTION WITH	)	Confirmation No.: 2590
UNAMPLIFIED DNA	)	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**SIXTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. WO 92/04469 published 19 March 1992
2. WO 90/02205 published 8 March 1990
3. Borman, *Chem.Eng. News*, December 9, 1996, pp. 42-43 (1996)
4. Tomlinson et al. *Anal Biochem*, Vol. 171, pp. 217-222 (1998)

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In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

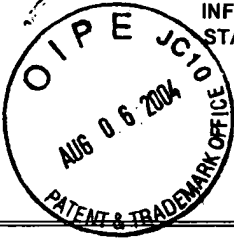
Dated: Aug 4, 2009

Respectfully submitted,

  
\_\_\_\_\_  
Emily Miao  
Registration No. 35,285

**McDonnell Boehnen Hulbert & Berghoff LLP**  
300 South Wacker Drive  
Chicago, Illinois 60606  
Telephone : (312) 913-0001  
Facsimile: (312) 913-0002

Serial No.  
10/735,357



**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

**Applicant:** Bao, et al.

Filing Date: December 12, 2003

Group: 1645

## U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date

## FOREIGN PATENT DOCUMENTS

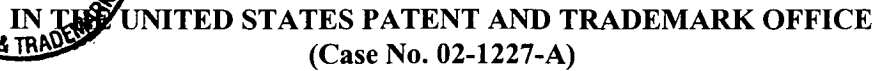
		Document Number	Date	Country	Class	Subclass	Translation Yes No
	1.	WO 92/04469	19 March 1992	PCT			X
	2.	WO 90/02205	8 March 1990	PCT			X

**OTHER DOCUMENTS - Including Author, Title, Date, Pertinent Pages, Etc.**

[illegible]

Examiner	Date Considered
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**EXAMINER:** Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with any communication.



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**  
**(Case No. 02-1227-A)**

Confirmation No. 2590

**McDonnell Boehnen Hulbert & Berghoff LLP**  
300 South Wacker Drive, 32nd Floor  
Chicago, IL 60606  
Telephone: (312) 913-0001  
Fax: (312) 913-0002



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 02-1227-A)

PATENT

In re Application of:	)	
	)	
Bao, et al.	)	Examiner: TBA
	)	
Serial No. 10/735,357	)	
	)	Group Art Unit: 1645
Filed: December 12, 2003	)	
	)	
For: DIRECT SNP DETECTION WITH	)	Confirmation No.: 2590
UNAMPLIFIED DNA	)	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**THIRD SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Natan, U.S. Patent No. 5,609,907, issued March 11, 1997.
2. Natan, U.S. Patent No. 6,025,202, issued February 15, 2000.
3. Natan, et al., U.S. Patent No. 6,149,868, issued November 21, 2000.

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the

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attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

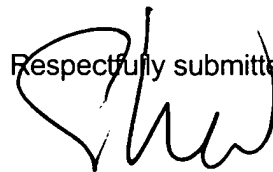
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Early and favorable consideration is earnestly solicited.

Dated: Aug. 4, 2004

**McDonnell Boehnen Hulbert & Berghoff LLP**  
300 South Wacker Drive  
Chicago, Illinois 60606  
Telephone: (312) 913-0001  
Facsimile: (312) 913-0002

Respectfully submitted,



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Emily Miao  
Registration No. 35,285

FORM PTO-1449  
(Rev. 2-32)

U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No.

02-1227-A

Serial No.

10/735,357



INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(Use several sheets if necessary)

Applicant:

Bao, et al.

Filing Date:

December 12, 2003

Group:

1645

U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	1.	5,609,907	03/11/97	Natan			
	2.	6,025,202	02/15/00	Natan			
	3.	6,149,868	11/21/00	Natan, et al.			

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation Yes No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).


EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.



In re Application of:

Yijia P. Bao, et al.

Serial No.: 10/735,357

Filed: December 12, 2003

For: DIRECT SNP DETECTION WITH  
UNAMPLIFIED DNA

Examiner: TBA

Art Unit: 1645

Confirmation No. 2590

## TRANSMITTAL LETTER

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

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- Supplemental Information Disclosure Statement with copies of 11 references
- IDS PTO Form-1449
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2. With respect to fees:

- a) No check is attached.
- b) **General Authorization:** Please charge any underpayment or credit any overpayment  
our Deposit Account, No. 13-2490.

3. CERTIFICATE OF MAILING UNDER 37 CFR § 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described in paragraph 1 hereinabove, are being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 4 day of August, 2004.

Date:

Respectfully submitted,

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Emily Miao

Registration No. 35,285



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 02-1227-A)

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 Bao, et al. ) Examiner: TBA  
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 Serial No. 10/735,357 )  
 ) Group Art Unit: 1645  
 Filed: December 12, 2003 )  
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1. Heller, et al., U.S. Patent No. 4,966,143 issued 02/26/91
2. Kausch, et al., U.S. Patent No. 5,508,164 issued 04/16/96
3. Ewart, et al., U.S. Patent No. 5,922,537 issued 07/13/99
4. An, et al., U.S. Patent No. 5,972,615 issued 10/26/99
5. Blackburn, et al., U.S. Patent No. 6,264,825 issued 07/24/01
6. Yguerabide, et al., U.S. Patent No. 6,214,560 issued 04/10/01

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7. International Patent WO 94/29484 published 12/22/94
8. International Patent WO 00/25136 published 05/04/00
9. Mohanty J., et al., "Pulsed laser excitation of phosphate stabilized silver nanoparticles," *Proc. Indian Acad.*, Vol. 112, No. 1, p. 63-72 (2000)
10. Nicewarner- Peña S., et al., "Hybridization and Enzymatic Extension of Au Nanoparticle-Bound Oligonucleotides," *J. Am. Chem. Soc.*, Vol. 124, p. 7314-7323 (2002)
11. Whitesides G.M., et al., "Soft Lithography in Biology and Biochemistry," *Annu. Rev. Biomed. Eng.*, p. 335-373 (2001)


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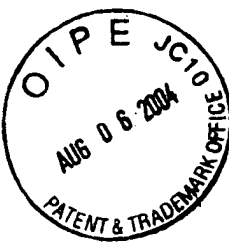
Early and favorable consideration is earnestly solicited.

Respectfully submitted,

Dated: 8/4/04

  
\_\_\_\_\_  
Emily Miao  
Registration No. 35,285

McDonnell Boehnen Hulbert & Berghoff LLP  
300 South Wacker Drive, Suite 3200  
Chicago, Illinois 60606  
Telephone : (312) 913-0001  
Facsimile: (312) 913-0002

<b>FORM PTO-1449</b> (Rev. 2-32)	<b>U.S. Department of Commerce</b> <b>Patent and Trademark Office</b>	<b>Atty. Docket No.</b>  02-1227-A	<b>Serial No.</b>  10/735,357
 <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use several sheets if necessary)		<b>Applicant:</b>  Bao, et al.	
		<b>Filing Date:</b>  December 12, 2003	<b>Group:</b>  1645

**U.S. PATENT DOCUMENTS**

Examiner Initial	1.	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	1.	4,996,143	02/26/91	Heller, et al.	435	6	04/13/90
	2.	5,508,164	04/16/96	Kausch, et al.	435	6	10/29/93
	3.	5,922,537	07/13/99	Ewart, et al.	435	6	11/8/96
	4.	5,972,615	10/26/99	An, et al.	435	6	01/21/98
	5.	6,264,825	07/24/01	Blackburn, et al.	205	777.5	06/23/99
	6.	6,214,560	04/10/01	Yguerabide, et al.	435	7.1	04/18/97

**FOREIGN PATENT DOCUMENTS**

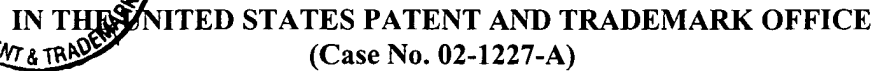
		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
	7.	WO 94/29484	12/22/94	PCT				
	8.	WO 00/25136	05/04/00	PCT				

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).**

9.	Mohanty J., et al. "Pulsed laser excitation of phosphate stabilized silver nanoparticles," <i>Proc. Indian Acad. Sci.</i> , Vol. 112, No. 1, p. 63-72.
10.	Nicewarner- Peña S., et al., "Hybridization and Enzymatic Extension of Au Nanoparticle-Bound Oligonucleotides," <i>J. Am. Chem. Soc.</i> , Vol. 124, p. 7314-7323 (2002)
11.	Whitesides G.M., et al., "Soft Lithography in Biology and Biochemistry," <i>Annu. Rev. Biomed. Eng.</i> , p. 335-373 (2001)

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.



In re Application of:

Yijia P. Bao, et al.

Serial No.: 10/735,357

Filed: December 12, 2003

For: DIRECT SNP DETECTION WITH  
UNAMPLIFIED DNA

Examiner: TBA

Art Unit: 1645

Confirmation No. 2590

**McDonnell Boehnen Hulbert & Berghoff LLP**  
300 South Wacker Drive, 32nd Floor  
Chicago, IL 60606  
Telephone: (312) 913-0001  
Fax: (312) 913-0002



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 02-1227-A)

In re Application of:	)	
	)	
Bao, et al.	)	Examiner: TBA
	)	
Serial No. 10/735,357	)	
	)	Group Art Unit: 1645
Filed: December 13, 2003	)	
	)	
For: DIRECT SNP DETECTION WITH	)	Confirmation No.: 2590
UNAMPLIFIED DNA	)	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**FIFTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Ullman et al., U.S. Patent No. 4,193,983 issued 03/18/80
2. Zuk et al., U.S. Patent No. 4,256,834 issued 03/17/81
3. Ullman et al., U.S. Patent No. 4,261,968 issued 04/14/81
4. Leuving, U.S. Patent No. 4,313,734 issued 02/02/82

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<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.

5. Litman et al., U.S. Patent No. 4,318,707 issued 03/09/82
6. Liu et al., U.S. Patent No. 4,650,770 issued 03/17/87
7. Ullman, U.S. Patent No. 4,713,348 issued 12/15/87
8. Olsen et al., U.S. Patent No. 4,853,335 issued 08/01/89
9. Kurn et al., U.S. Patent No. 4,868,104 issued 09/19/89
10. Henkens et al., U.S. Patent No. 5,225,064 issued 07/06/93
11. Shigekawa et al., U.S. Patent No. 5,294,369 issued 03/15/94
12. Shigekawa et al., U.S. Patent No. 5,384,073 issued 01/24/95
13. Kidwell et al., U.S. Patent No. 5,384,265 issued 01/24/95
14. Kossovsky et al., U.S. Patent No. 5,460,831 issued 10/24/95
15. Beebe et al., U.S. Patent No. 5,472,881 issued 12/05/95
16. Brooks, Jr. et al., U.S. Patent No. 5,514,602 issued 05/07/96
17. Hainfeld et al., U.S. Patent No. 5,521,289 issued 05/28/96
18. Gref et al., U.S. Patent No. 5,543,158 issued 08/06/96
19. Brooks, Jr. et al., U.S. Patent No. 5,571,726 issued 11/05/96
20. Kausch et al., U.S. Patent No. 5,665,582 issued 09/09/97
21. Letsinger et al., U.S. Patent No. 5,681,943 issued 10/28/97
22. International Patent No. WO 89/06801 published 07/27/89
23. International Patent No. WO 97/40181 published 10/30/97
24. International Patent No. WO 98/04740 published 02/05/98
25. International Patent No. WO 99/23258 published 12/28/94
26. European Patent 0 630 974 A2 published 06/21/94
27. European Patent 0 667 398 A2 published 08/16/95

28. Alivisatos et al., "Organization of 'nanocrystal molecules' using DNA," *Nature*, Vol. 382, pp. 609-611 (1996)
29. Bain, et al., "Modeling Organic Surfaces with Self-Assembled Monolayers," *Angew. Chem. Int. Ed. Engl.*, Vol. 28, pp. 506-512 (1989)
30. Bradley, "The Chemistry of Transition Metal Colloids," *Clusters and Colloids: From Theory to Applications*, G. Schmid, Editor, BCH, Weinheim, New York, pp. 459-542 (1994)
31. Brust et al., "Novel Gold-Dithiol Nano-Networks with Non-Metallic Electronic Properties," *Adv. Mater.*, Vol. 7, pp. 795-797 (1995)
32. Chen et al., "A Specific Quadrilateral Synthesized from DNA Branched Junctions," *J. Am. Chem. Soc.*, Vol. 111, pp. 6402-6407 (1989)
33. Chen & Seeman, "Synthesis from DNA of a molecule with the connectivity of a cube," *Nature*, Vol. 350, pp. 631-633 (1991)
34. Chen et al., "Crystal Structure of a Four-Stranded Intercalated DNA:  $d(C_4)^{4+}$ ," *Biochem.*, Vol. 33, pp. 13540-13546 (1994)
35. Dagani, "Supramolecular Assemblies DNA to organize gold nanoparticles," *Chemical & Engineering News*, p. 6-7, August 19, 1996
36. Dubois & Nuzzo, "Synthesis, Structure, and Properties of Model Organic Surfaces," *Annu. Rev. Phys. Chem.*, Vol. 43, pp. 437-464 (1992)
37. Elghanian et al., "Selective Colorimetric Detection of Polynucleotides Based on the Distance-Dependent Optical Properties of Gold Nanoparticles," *Science*, Vol. 277, pp. 1078-1081 (1997)
38. Grabar et al., "Preparation and Characterization of Au Colloid Monolayers," *Anal. Chem.* Vol. 67, pp. 735-743 (1995)
39. Hacia et al., "Detection of heterozygous mutations in BRCA1 using high density oligonucleotide arrays and two-colour fluorescence analysis," *Nature Genet.*, Vol. 14, pp. 441-447 (1996)

40. Jacoby, "Nanoparticles change color on binding to nucleotide target," *Chemical & Engineering News*, p. 10, August 25, 1997
41. Letsinger et al., "Use of Hydrophobic Substituents in Controlling Self-Assembly of Oligonucleotides," *J. Am. Chem. Soc.*, Vol. 115, pp. 7535-7536 (1993)
42. Letsinger et al., "Control of Excimer Emission and Photochemistry of Stilbene Units by Oligonucleotide Hybridization," *J. Am. Chem. Soc.*, Vol. 116, pp. 811-812 (1994)
43. Marsh et al., "A new DNA nanostructure, the G-wire, imaged by scanning probe microscopy," *Nucleic Acids Res.*, Vol. 23, pp. 696-700 (1995)
44. Mirkin, "H-DNA and Related Structures," *Annu. Review Biophys. Biomol. Struct.*, Vol. 23, pp. 541-576 (1994)
45. Mirkin et al., "A DNA-based method for rationally assembling nanoparticles into macroscopic materials," *Nature*, Vol. 382, pp. 607-609 (1996)
46. Mirkin et al., "DNA-Induced Assembly of Gold Nanoparticles: A Method for Rationally Organizing Colloidal Particles into Ordered Macroscopic Materials," *Abstract 249*, Abstracts of Papers Part 1, 212 ACS National Meeting 0-8412-3402-7, American Chemical Society, Orlando, FL, August 25-29, 1996
47. Mucic et al., "Synthesis and characterizations of DNA with ferrocenyl groups attached to their 5'-termini: electrochemical characterization of a redox-active nucleotide monolayer," *Chem. Commun.*, pp. 555-557 (1996)
48. Mulvaney, "Surface Plasmon Spectroscopy of Nanosized Metal Particles," *Langmuir*, Vol. 12, pp. 788-800 (1996)
49. Rabke-Clemmer et al., "Analysis of Functionalized DNA Adsorption on Au(111) Using Electron Spectroscopy," *Langmuir*, Vol. 10, pp. 1796-1800 (1994)
50. Roubi, "MOLECULAR MACHINES – Nanodevice with rotating arms assembled from synthetic DNA," *Chemical & Engineering News*, p. 13, (Jan. 1999)
51. Seeman et al., "Synthetic DNA knots and catenanes," *New J. Chem.*, Vol. 17, pp. 739-755 (1993)



52. Shaw & Wang, "Knotting of a DNA Chain During Ring Closure," *Science*, Vol. 260, pp. 533-536 (1993)
53. Shekhtman et al., "Stereostructure of replicative DNA catenanes from eukaryotic cells," *New J. Chem.* Vol. 17, pp. 757-763 (1993)
54. Smith and Feigon, "Quadruplex structure of Oxytricha telomeric DNA oligonucleotides," *Nature*, Vol. 356, pp. 164-168 (1992)
55. Thein et al., "The use of synthetic oligonucleotides as specific hybridization probes in the diagnosis of genetic disorders," 2<sup>nd</sup> Ed., K.E. Davies, Ed., Oxford University Press, Oxford, New York, Tokyo, p. 21-33 (1993)
56. Wang et al., "Assembly and Characterization of Five-Arm and Six-Arm DNA Brached Junctions," *Biochem.*, Vol. 30, pp. 5667-5674 (1991)
57. Wang et al., "A DNA Aptamer Which Binds to and Inhibits Thrombin Exhibits a New Structural Motif for DNA," *Biochem.*, Vol. 32, pp. 1899-1904 (1993)
58. Weisbecker et al., "Molecular Self-Assembly of Aliphatic Thiols on Gold Colloids," *Langmuir*, Vol. 12, pp. 3763-3772 (1996)
59. Wells, "Unusual DNA Structures," *J. Biol. Chem.*, Vol. 263, pp. 1095-1098 (1988)
60. Zhang et al., "Informational Liposomes: Complexes Derived from Cholesteryl-conjugated Oligonucleotides and Liposomes," *Tetrahedron Lett.*, Vol. 37, pp. 6243-6246 (1996)

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the

guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

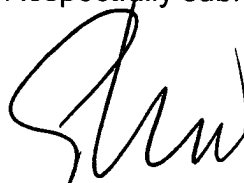
The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

Dated: Aug. 4, 2004

**McDonnell Boehnen Hulbert & Berghoff LLP**  
300 South Wacker Drive  
Chicago, Illinois 60606  
Telephone: (312) 913-0001  
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Respectfully submitted,



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Emily Miao  
Registration No. 35,285

Form PTO-1449

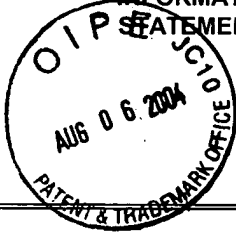
U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No.

Serial No.

02-1227-A

10/735,357

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

Applicant: Bao, et al.

Filing Date:  
December 12, 2003

Group: 1645

## U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date
	1.	4,193,983	3/18/80	Ullman et al.			
	2.	4,256,834	3/17/81	Zuk et al.			
	3.	4,261,968	4/14/81	Ullman et al.			
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	5.	4,318,707	3/9/82	Litman et al.			
	6.	4,650,770	3/17/87	Liu et al.			
	7.	4,713,348	12/15/87	Ullman			
	8.	4,853,335	8/1/89	Olsen et al.			
	9.	4,868,104	9/19/89	Kurn et al.			
	10.	5,225,064	7/6/93	Henkens et al.			
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	12.	5,384,073	1/24/95	Shigekawa et al.			
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	18.	5,543,158	8/6/96	Gref et al.			
	19.	5,571,726	11/05/96	Brooks, Jr. et al.			
	20.	5,665,582	9/9/97	Kausch et al.			
	21.	5,681,943	10/28/97	Letsinger et al.			

## OTHER DOCUMENTS - Including Author, Title, Date, Pertinent Pages, Etc.

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Examiner

Date Considered

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Form PTO-1449	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-1227-A	Serial No. 10/735,357
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		Applicant: Bao, et al.	
		Filing Date: December 12, 2003	Group: 1645

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## FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation Yes No
22.	WO 89/06801	7/27/89	PCT			
23.	WO 97/40181	10/30/97	PCT			
24.	WO 98/04740	2/5/98	PCT			
25.	WO 99/23258	12/28/94	PCT			
26.	0 630 974 A2	06/21/94	EPO			
27.	0 667 398 A2	8/16/95	EPO			

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31.	Brust et al., "Novel Gold-Dithiol Nano-Networks with Non-Metallic Electronic Properties," <i>Adv. Mater.</i> , Vol. 7, pp. 795-797 (1995)
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34.	Chen et al., "Crystal Structure of a Four-Stranded Intercalated DNA: d(C <sub>4</sub> ) <sup>††</sup> <i>Biochem.</i> , Vol. 33, pp. 13540-13546 (1994)
35.	Dagani, "Supramolecular Assemblies DNA to organize gold nanoparticles," <i>Chemical &amp; Engineering News</i> , p. 6-7, August 19, 1996

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Form PTQ-1449	U.S. Department of Commerce Patent and Trademark Office	Atty. Docket No. 02-1227-A	Serial No. 10/735,357
INFORMATION DISCLOSURE STATEMENT BY APPLICANT		Applicant: Bao, et al.	
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37.	Elghanian et al., "Selective Colorimetric Detection of Polynucleotides Based on the Distance-Dependent Optical Properties of Gold Nanoparticles," <i>Science</i> , Vol. 277, pp. 1078-1081 (1997)
38.	Grabar et al., "Preparation and Characterization of Au Colloid Monolayers," <i>Anal. Chem.</i> Vol. 67, pp. 735-743 (1995)
39.	Hacia et al., "Detection of heterozygous mutations in BRCA1 using high density oligonucleotide arrays and two-colour fluorescence analysis," <i>Nature Genet.</i> , Vol. 14, pp. 441-447 (1996)
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43.	Marsh et al., "A new DNA nanostructure, the G-wire, imaged by scanning probe microscopy," <i>Nucleic Acids Res.</i> , Vol. 23, pp. 696-700 (1995)
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47.	Mucic et al., "Synthesis and characterizations of DNA with ferrocenyl groups attached to their 5'-termini: electrochemical characterization of a redox-active nucleotide monolayer," <i>Chem. Commun.</i> , pp. 555-557 (1996)
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Form PTO-1449  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>	U.S. Department of Commerce Patent and Trademark Office		Atty. Docket No.  02-1227-A	Serial No.  10/735,357
	Applicant: Bao, et al.			
	Filing Date: December 12, 2003		Group: 1645	

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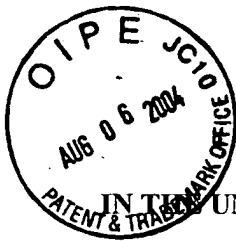
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50.	Roubi, "MOLECULAR MACHINES – Nanodevice with rotating arms assembled from synthetic DNA," <i>Chemical &amp; Engineering News</i> , p. 13, (Jan. 1999)
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55.	Thein et al., "The use of synthetic oligonucleotides as specific hybridization probes in the diagnosis of genetic disorders," 2 <sup>nd</sup> Ed., K.E. Davies, Ed., Oxford University Press, Oxford, New York, Tokyo, p. 21-33 (1993)
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PATENT

UNITED STATES PATENT AND TRADEMARK OFFICE

(Case No. 02-1227-A)

In re Application of:

Yijia P. Bao, et al.

Serial No.: 10/735,357

Filed: December 12, 2003

For: DIRECT SNP DETECTION WITH  
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Examiner: TBA

Art Unit: 1645

Confirmation No. 2590

**TRANSMITTAL LETTER**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

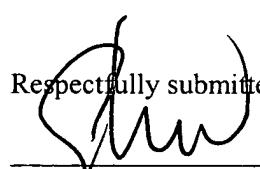
Sir:

- In regard to the above identified application.
1. We are transmitting herewith the attached:
    - a) Fourth Supplemental Information Disclosure Statement with copies of 5 references
    - b) IDS PTO Form-1449
    - c) Return Receipt Postcard
  2. With respect to fees:
    - a) No check is attached.
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  3. CERTIFICATE OF MAILING UNDER 37 CFR § 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described in paragraph 1 hereinabove, are being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 4 day of August, 2004.

Date:

Aug. 4, 2004

Respectfully submitted,

  
Emily Miao

Registration No. 35,285



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 02-1227-A)

In re Application of:	)	
	)	
Bao, et al.	)	Examiner: TBA
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Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**FOURTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Sir:

In order to comply with discretionary regulations 37 CFR §§1.97 and 1.98, attached hereto is Form PTO-1449, copies<sup>1</sup> of the documents listed thereon. These documents contain information which the Examiner may consider to be important in deciding whether to allow the present application to issue as a patent.

1. Brada, et al., "Golden Blot" – Detection of Polyclonal and Monoclonal Antibodies Bound to Antigens on Nitrocellulose by Protein A-Gold Complexes, *Analytical Biochemistry*, Vol. 42, pp. 79-83 (1984) U.S.

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<sup>1</sup>To the extent that a document is listed and no copy of same is attached, then such document is not at the present time available to the undersigned or is available in the file of a parent application. If a listed document is not in the English language and an English translation is readily available, such translation is also attached; if translation is not attached it is not readily available to the undersigned. If a foreign language patent document is cited, and an English language equivalent is known to the undersigned, then such equivalent patent is also cited on the attached form along with the corresponding foreign language patent and a connecting arrow indicated therebetween; if no such English language equivalent is cited, then none is known to undersigned.



FORM PTO-1449  
(Rev. 2-32)

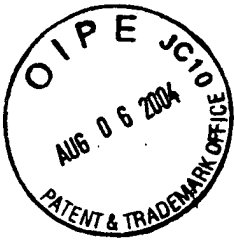
U.S. Department of Commerce  
Patent and Trademark Office

Atty. Docket No.

02-1227-A

Serial No.

10/735,357



**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use several sheets if necessary)

**Applicant:**

Bao, et al.

**Filing Date:**

December 12, 2003

**Group:**

1645

**U.S. PATENT DOCUMENTS**

Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate

**FOREIGN PATENT DOCUMENTS**

Document Number	Date	Country	Class	Subclass	Translation Yes No

**OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc).**

1.	Brada, et al., "Golden Blot" – Detection of Polyclonal and Monoclonal Antibodies Bound to Antigens on Nitrocellulose by Protein A-Gold Complexes, <i>Analytical Biochemistry</i> , Vol. 42, pp. 79-83 (1984) U.S.
2.	Dunn, et al., "A Novel Method to Map Transcripts: Evidence for homology between an Adenovirus mRNA and Discrete Multiple Regions of the Viral Genome, <i>Cell</i> , Vol. 12, pp. 23-36, (1997) U.S.
3.	Hacker, "High performance Nanogold – Silver in situ hybridisation, <i>Eur. J. Histochem</i> , Vol. 42, pp. 111-120 (1998) U.S.
4.	Ranki, et al., "Sandwich hybridization as a convenient method for the detection of nucleic acids in crude samples," <i>Gene</i> , Vol. 21, pp. 77-85 (1983) U.S.
5.	Romano, et al., "An antiglobulin reagent labelled with colloidal gold for use in electron microscopy," <i>Immunochemistry</i> , Vol. 11, pp. 521-522 (1974) Great Britain

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication.

of examination, will make an independent search and will determine the best prior art consistent with 37 CFR 1.104(a) and 1.106(b) and, in the course of each search, will review for relevance every document cited on the attached form even if not initialed.

Early and favorable consideration is earnestly solicited.

Respectfully submitted,



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Emily Miao  
Registration No. 35,285

Dated: \_\_\_\_\_

*Aug. 4, 2004*

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2. Dunn, et al., "A Novel Method to Map Transcripts: Evidence for homology between an Adenovirus mRNA and Discrete Multiple Regions of the Viral Genome, *Cell*, Vol. 12, pp. 23-36, (1997) U.S.
3. Hacker, "High performance Nanogold – Silver in situ hybridisation, *Eur. J. Histochem*, Vol. 42, pp. 111-120 (1998) U.S.
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5. Romano, et al., "An antiglobulin reagent labelled with colloidal gold for use in electron microscopy," *Immunochemistry*, Vol. 11, pp. 521-522 (1974) Great Britain

In accordance with MPEP Sections 609 and 707.05(b), it is requested that each document cited (including any cited in applicant's specification which is not repeated on the attached Form PTO-1449) be given thorough consideration and that it be cited of record in the prosecution history of the present application by initialing on Form PTO-1449. Such initialing is requested even if the Examiner does not consider a cited document to be sufficiently pertinent to use in a rejection, or otherwise does not consider it to be prior art for any reason, or even if the Examiner does not believe that the guidelines for citation have been fully complied with. This is requested so that each document becomes listed on the face of the patent issuing on the present application.

The present Disclosure Statement is being submitted in compliance with 37 CFR 1.56 insofar as an Examiner might consider any of the cited documents important in deciding whether to allow the application to issue as a patent, but the citation of each document is not to be construed as an admission that such document is necessarily relevant or prior art. No representation is intended that the cited documents represent the results of a complete search, and it is anticipated that the Examiner, in the normal course